

REMARKS/ARGUMENTS

Claims 1-49 were originally pending. No Claims have been amended. No claims have been added. No claims have been cancelled. Claims 1-40 have been withdrawn from examination with traverse (as described below) in view of a restriction requirement discussed in an Office initiated a 10/29/03 telephone interview. During the interview, claims 1-49 were discussed. Claims 41-49 were elected for continued examination.

In view of the following arguments, withdrawal of all outstanding rejections and objections to pending claims 41-49 is respectfully requested.

Claim Restriction Under 35 USC §121

Claims 1-49 stand restricted under 35 U.S.C. §121 as containing two patentably distinct inventions. In particular, the November 05, 2003 Office action ("ACTION") asserts that the following claim groupings represent two distinct or independent inventions as follows:

I. Claims 1-40, drawn to an integrated circuit card with debugging ability, classified in class 714, subclass 38; and

II. Claims 41-49, drawn to an application development tool for use with a debugger, classified in class 717, subclass 124.

According to the MPEP §803, if examination of an entire application can be made without serious burden, the application must be examined on the merits, even though the application may include two distinct or independent inventions. It

1 is respectfully submitted that the subject matter of claim groups I and II are  
2 sufficiently related such that the Office will likely have to search each of the  
3 indicated classes/subclasses to perform an efficient examination of the claimed  
4 subject matter of either claim group. Thus, even if it were true that these claim  
5 groups claim two distinct or independent inventions, as the ACTION asserts, both  
6 claim groups can be conveniently searched and examined together without serious  
7 burden on the office.

8 Accordingly, the restriction requirement should be withdrawn.

9 In the event that the restriction requirement is maintained, claims 1-40 are  
10 withdrawn from consideration under 35 USC §1.142(b), as being drawn to non-  
11 elected subject matter, and claims 41-49 are elected for continued examination.

12  
13 Claim Rejections Under 35 USC §102(e)

14 Claims 41-49 stand rejected under 35 USC §102(e) as being anticipated by  
15 U.S. patent application 6,173,419 to Barnett. This rejection is traversed.

16 Claim 41 recites

17 "a smart card incorporating a smart card development  
18 interface, coupled to the computer system, to receive and identify  
19 debug frames interlaced with application frames within a normal  
20 communication flow between the application executing on the  
21 computer system and the smart card", and "wherein the smart card  
22 development interface promotes the application frames to an  
23 application layer of the smart card, and invokes debug features of  
24 the smart card in response to debug instructions embedded within  
25 the received debug frames."

1 To anticipate a claim, the reference must teach each and every element of a claim.  
2 (See, MPEP §2131.01). Barnet does not teach each and every element of claim 41  
3 for the following reasons.

4 Barnett's emulator is not "a smart card incorporating a smart card  
5 development interface", as claim 41 recites. Rather, Barnett's emulator is a  
6 software debugging tool that uses external hardware, such as the floating point  
7 gate array 100 of Fig. 6, to emulate and interface with a microprocessor embedded  
8 in a target circuit—such as a smart card. Referring to col. 5, line 31, through col.  
9 7, line 11, Barnet teaches that the external emulation hardware is used to debug  
10 logic in a smart card connected to the external emulation hardware via a card  
11 reader. More particularly, Barnet describes that floating point gate array (FPGA)  
12 100 of the emulator is programmed with debug logic 104 to give a programmer a  
13 view into the functioning of a modeled microcontroller such as a smart card.  
14 Barnett stores the debug logic as well as the modeled microcontroller codes in  
15 FPGA RAM (see RAM 106 of Fig. 6). Moreover, Barnet at col. 4, lines 57-61,  
16 describes that "[t]he emulator substitutes for the target microprocessor during  
17 target circuit testing and execution. The overlay RAM allows the programmer to  
18 debug the program code even when the target circuit is not completely physical".

19 Although Barnet does not show a smart card or a smart card reader in any  
20 of the figures, col. 6, lines 51-57 describes that the smart card can be coupled to  
21 the FPGA 100 via a card reader. Moreover, Fig. 7 shows a plug 110 that goes into  
22 a smart card reader, wherein the smart card reader is coupled to emulator  
23 debug logic 104. Thus, Barnett describes that any smart card to be debugged is  
24 separate and distinct from the FPGA 100 that comprises Barnett's emulator debug  
25 logic 104—part of the external hardware that may be used to debug a smart card.

1 This description of Barnett is in stark contrast to the claimed features, wherein the  
2 circuit targeted for application development is the claimed "smart card  
3 incorporating a smart card development interface". Barnett's distinction between  
4 logic of a smart card that is being debugged and the emulator of Barnett is also  
5 pointed out at col. 6, lines 51 through col. 5 line 9, describing that since a "target  
6 CPU" (e.g., a smart card) and the FPGA are not made from the same form of  
7 silicon, "[t]he FPGA is not able to handle the timing and asynchronous signals on  
8 the pins of a target CPU." For at least each of these reasons, Barnett's emulator  
9 does not describe the "smart card" of claim 41.

10 As an additional matter, Barnett essentially teaches what Applicant  
11 described in the "Background of the Invention" section of the specification. For  
12 example, the specification at page 2, paragraph 3, indicates that "due to the  
13 physical and processing constraints placed on the smart card, prior art smart cards  
14 do not enjoy any dedicated debug facilities. Aside from the limited processing and  
15 memory attributes of a smart card, a smart card typically has but a single, bi-  
16 directional input/output (I/O) port. The communication bandwidth of this single  
17 I/O port is typically consumed to support execution of the smart card application  
18 itself, leaving little to no communication bandwidth to support debug features.  
19 Thus, application development using a smart card itself is virtually impossible.  
20 Consequently the development of applications for a smart card currently requires  
21 the use of an in-circuit emulator (ICE) [such as the emulator of Barnett] and an  
22 associated, often proprietary software development application."

23 Accordingly, the 35 USC §102(c) rejection of claim 41 as anticipated by  
24 Barnett is improper and should be withdrawn.  
25

1        Additionally, claim 41 recites that the "smart card development interface,  
2        coupled to the computer system, to receive and identify debug frames interlaced  
3        with application frames". Barnett is completely silent with respect to these claimed  
4        features. Moreover, claim 41 also recites "wherein the smart card development  
5        interface promotes the application frames to an application layer of the smart  
6        card". Nowhere does Barnett describe such a smart card "application layer".  
7        Further differentiation between the features of claim 41 and Barnett are evidenced  
8        by the recited "debug features of the smart card" which are invoked "in response  
9        to debug instructions embedded within the received debug frames." Nowhere  
10       does Barnett describe these claimed features.

11       For each of these additional reasons, the 35 USC §102(c) rejection of claim  
12       41 as anticipated by Barnett should be withdrawn.

13       Claims 42 - 49 depend from claim 41 and patentably distinguished over  
14       Barnett by virtue of this dependency. Accordingly, the 35 USC §102(e) rejection  
15       of claims 42-49 should be withdrawn.

16       Additionally, claims 42-49 describe additional features that are not  
17       described by Barnett. For example, claim 42 recites "a client development  
18       interface, to interlace debug frames generated by the application development tool  
19       with application frames generated by the application executing within the  
20       application development tool." In addressing this feature, the ACTION refers to  
21       Barnett, Fig. 7 and component 118, to conclude that this feature is anticipated.  
22       This conclusion is unsupportable.

23       Barnett, at col. 7, lines 12-29, describes that component 118 of Fig. 7 is a  
24       memory interface, not "client development interface", as claim 42 recites. In  
25       particular, Barnett describes that "characteristics of the memory are designed into

1 the programmable logic into the memory interface 118. This permits new and  
2 different memory technologies to be implemented into the same hardware."  
3 Clearly, this description does not teach or suggest "a client development interface,  
4 to interlace debug frames generated by the application development tool with  
5 application frames generated by the application executing within the application  
6 development tool", as Applicant claims. For this additional reason, the 35 USC  
7 §102(e) rejection of claim 42 should be withdrawn.

8 Moreover, although the ACTION has rejected claims 43-49 as being  
9 anticipated by Barnett, the ACTION does not provide any explanation of why the  
10 features of these claims were rejected. Yet, the numerous dependent claims of this  
11 application recite features having great significance to the Applicant, and these  
12 dependent claims do not necessarily stand or fall with their corresponding  
13 independent claims. The dependent claims are an attempt to conform to the PTO-  
14 preferred practice of submitting claims having a range of breadth. The applicant  
15 has submitted extra fees for the inclusion and examination of these claims. In  
16 response to this effort, it is the PTO's responsibility to fully examine each of the  
17 dependent claims, and to give full consideration to the limitations of these claims.  
18 In view of this, and to provide a complete application file history and to enhance  
19 the clarity of the prosecution history record, Applicant respectfully requests the  
20 Office to seriously evaluate the patentability of each and every dependent claim,  
21 and to support any dependent claim rejections with specific rationale and specific  
22 references to the prior art. (See, MPEP §707.07(f)).  
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Claim Rejections Under 35 USC §103(a)

Claims 43-49 stand rejected under 35 USC §103(a) as being unpatentable over Barnett in view of U.S. Patent no. 6,195,774 to Jacobson. This rejection is traversed.

Claim 43 recites "wherein the application development tool generates debug frames in response to user interaction with the application development tool." In addressing this claim, the ACTION admits that Barrett does not teach or suggest the claimed feature. Instead, the ACTION relies on the combination of Barnett with the boundary-scan system use during in-system programming and test of an integrated circuit (IC) teaching of Jacobson to conclude that the claimed feature is obvious. This conclusion is unsupportable.

Firstly, claim 43 depends from claim 42, which in turn, depends from independent claim 41. For the reasons already discussed, Barnett does not teach or suggest independent claim 41. Accordingly, not only is Barnett deficient to teaching each and every element of claim 43, as admitted by the ACTION, but Barnett is also deficient with respect to teaching each and every element of claim 41, from which claim 43 depends.

Moreover, the combination of these teachings of Barnett in view of Jacobson does not resolve these deficiencies for the following reasons. The ACTION points to Jacobson, col. 21, lines 77-40, which teaches "allow[ing] the development of applications to collect and analyze data as it passes through the native layer and facilitate user interaction with the system", to conclude that that it would have been obvious for a person of ordinary skill in the art to combine Barnett and Jacobson to arrive at the features of claim 43 because "using

1 interfaces to interact with users makes the system more automated and efficient".

2 This conclusion is unsupportable.

3        Jacobson teaches a "boundary scan method for use during in-system  
4 programming and test of an IC" on a printed circuit board (PCB) (See, Abstract).  
5 Boundary-scan operations are used to test and diagnose problems arising from loss  
6 of physical access caused by the increasing use of high pin counts on densely  
7 packed PCB assemblies. For instance, one such diagnostic procedure is described  
8 by Jacobson at col. 4, lines 3-17, wherein a boundary-scan operation is used to  
9 verify connection between first and second ICs on a PCB. It is respectfully  
10 submitted that such boundary-scan test operations do not teach or suggest "a smart  
11 card incorporating a smart card development interface" which is used to debug  
12 computer-program applications downloaded to a smart card .

13        This is further evidenced by Jacobson at col. 5, lines 5-16, wherein it is  
14 taught that a current problem with boundary-scan test (BST) is that BST  
15 commands written for one hardware platform often must be translated before they  
16 can be used on a different platform. To address this problem, Jacobson teaches  
17 generation of a BST API (e.g., see, col. 5, lines 25-35) based on a platform  
18 independent programming language such as Java. This BST API is used to  
19 provide cross platform compatibility for performing boundary test operations as  
20 described above (e.g., to verify connections on a PCB assembly). Nowhere does  
21 Jacobson teach or suggest that the BST API provides the features of the "smart  
22 card" recited in claim 41 from which claim 43 depends.

23        In view of these deficiencies of Jacobson with respect to the features of  
24 claim 41, combining Harnett's emulator, which is not a smart card, with  
25 Jacobson's BST API do not teach or suggest the feature of claim 41. Since claim



1 41 is the base claim of claim 43, claim 43 is allowable over the cited combination  
2 by virtue of this dependency.

3 Accordingly, the 35 USC §103(a) rejection of claim 43 is improper and  
4 should be withdrawn.

5 Claim 43 also depends from claim 42, which in turn depends from claim  
6 41. Claim 42 recites "a client development interface, to interlace debug frames  
7 generated by the application development tool with application frames generated  
8 by the application executing within the application development tool." In  
9 addressing this feature, the ACTION refers to Barnett, Fig. 7 and component 118  
10 to conclude that the cited combination renders claim 42 obvious. This conclusion  
11 is unsupportable at least for the reasons already provided above with respect to  
12 claim 41—claim 42's base claim.

13 Moreover, the section of Barnett, at col. 7, lines 12-29, cited by the  
14 ACTION teaches that component 118 of Fig. 7 is a memory interface, not "client  
15 development interface", as claim 42 recites. In particular, Barnett teaches that  
16 "characteristics of the memory are designed into the programmable logic into the  
17 memory interface 118. This permits new and different memory technologies to be  
18 implemented into the same hardware." Clearly, this description does not teach or  
19 suggest "a client development interface, to interlace debug frames generated by  
20 the application development tool with application frames generated by the  
21 application executing within the application development tool", as claim 42  
22 recites. For this additional reason, the cited combination does not teach or suggest  
23 the features of claim 43, which depends on claim 42.

24 Accordingly, for this additional reason, the 35 USC §103(a) rejection of  
25 claim 43 is improper and should be withdrawn.

Moreover, claim 43 recites "wherein the application development tool generates debug frames in response to user interaction with the application development tool." Note that the claimed "smart card [...] invokes debug features of the smart card in response to debug instructions embedded within the received debug frames". Nowhere do the references of record describe such "an application development tool generates debug frames" as claimed. Accordingly, and for this additional reason, the 35 USC §103(a) rejection of claim 43 should be withdrawn.

Claims 44-49 also depend from claim 41. At least for the reasons already discussed, claims 44-49 are also patentably distinguished over Harnett in view of Jacobson by virtue of this dependency. Accordingly, the 35 USC §103(a) rejections of claims 44-49 over Barnett in view of Jacobson should be withdrawn.

As an additional matter, although the ACTION has rejected claims 44-49 as being unpatentable over Barnett in view of Jacobson, the ACTION only providing an explanation for rejecting claim 45 (see below). The ACTION does not provide any explanation of why the features of claims 44, and 46-49 were rejected over this cited combination. To provide a complete application file history and to enhance the clarity of the prosecution history record, Applicant respectfully requests clear explanations of all actions taken by the examiner during prosecution of this application. (See, MPEP §707.07(f)).

This is especially pertinent since claims 44-49 recite additional features that are not taught or suggested by the cited combination. Referring to claim 45, claim 45 recites "wherein the debug frames invoke and control one or more smart card resources facilitating debugging of the application executing within the application development tool of the computer system". In addressing this feature, the

1 ACTION points to Jacobson, col. 5, lines 35-50, to conclude that these features are  
2 obvious in view of the cited combination. This conclusion is unsupportable.  
3 Jacobson at col. 5, lines 35-50 merely indicates that the Java programming  
4 language, which is used for implementing the BST API, is used to be compatible  
5 with potential hardware platforms. This does not teach or suggest the "wherein  
6 the debug frames invoke and control one or more smart card resources facilitating  
7 debugging of the application executing within the application development tool of  
8 the computer system", as claim 45 recites. Thus, the features of claim 45 are not  
9 taught or suggested by the cited combination.

10 Accordingly, and for this additional reason, the 35 USC §103(a) rejection  
11 of claim 45 over the cited combination should be withdrawn.

12  
13 Claims 43-49 stand rejected under 35 USC §103(a) as being unpatentable  
14 over Barnett as applied to claims 41 and 42, in view of U.S. Patent no. 5,787,245  
15 to You et al (hereinafter referred to as "You"). This rejection is traversed.

16 As a preliminary matter, although the ACTION has rejected claims 43-49  
17 as being unpatentable over Barnett in view of You, the ACTION does not provide  
18 any explanation of why the features of claims 43-45, and claim 48 were rejected  
19 over this cited combination, only providing an explanation (see below) for  
20 rejecting claims 46, 47, and 49. The detailed arguments below are intended to  
21 aid the Office in recognizing and assessing the limitations presented in the  
22 dependent claims. However, to provide a complete application file history and to  
23 enhance the clarity of the prosecution history record, Applicant respectfully  
24 requests clear explanations of all actions taken by the Office during prosecution of  
25 this application. (See, MPEP §707.07(f)).

1        Claims 43-49 depend from claim 41. For the reasons already discussed,  
2 Barnett does not teach or suggest the features of claim 41. Accordingly, not only is  
3 Barnett deficient in teaching each and every element of claim 43, as admitted by  
4 the ACTION, but Barnett is also deficient with respect to teaching each and every  
5 element of claim 41, from which claim 43 depends.

6        Moreover, the combination of these teaching of Barnett in view of You  
7 does not resolve these deficiencies for the following reasons. With respect to You,  
8 You in the "Overview of the Invention" at col. 8, lines 63 through col. 9, line 9,  
9 teaches Portable Debugging Services (PDS) that are implemented in a client-  
10 server program model. A client-server program model is based on network  
11 architecture in which each computer or process on the network is either a client or  
12 a server computer. Nowhere does You teach or suggest that the described client-  
13 server network architecture based PDS is used for smart card application  
14 development. Instead, You is completely silent both with respect smart cards and  
15 development environments for integrated circuits such as smart cards. Thus, You  
16 does not resolve the previously described deficiencies of Barnett with respect to  
17 teaching or suggesting the claimed features.

18        For this reason alone, the combination of Barnett in view of You does not  
19 teach or suggest the "smart card" recited in claim 41. Since claim 41 is the base  
20 claim of claims 43-49, the cited combination does not teach or suggest the features  
21 of claims 43-49. Accordingly, the 35 USC §103 rejections of claims 43-49 over  
22 Barnett in view of You are improper and should be withdrawn.

23        Moreover, claims 43-49 recited additional features that are not taught or  
24 suggested by the cited combination of Barnett in view of You. For example, claim  
25 46 recites "wherein the client development interface includes a debug filter to

1 identify and route debug frames received from the smart card". In addressing  
2 these features, the ACTION admits that Barnett does not teach or suggest the  
3 features of claim 46. Instead, the ACTION relies on the teaching at col. 4, lines  
4 35-39 of You to conclude that the recited features are obvious in over the  
5 combination of references. This conclusion is unsupportable.

6 Col. 4, lines 35-39 of You teach "[t]he client debugger object transmits  
7 debug requests to a target server debugger object. The connection object is  
8 responsible for routing the request to the target server object. The client-server  
9 model typically operates under a common pattern: the client initiates a request to a  
10 server, the server ...." Clearly, this teaching of a conventional client-server  
11 communication architecture is completely silent with respect to a "smart card  
12 development interface promotes the application frames to an application layer of  
13 the smart card, and invokes debug features of the smart card in response to debug  
14 instructions embedded within the received debug frames", as claim 41 recites and  
15 upon which claim 46 relies. Moreover, nowhere does this portion of You, which  
16 describe conventional client-server program object communications, or any other  
17 portions of the cited combination, teach or suggest any "a debug filter to identify  
18 and route debug frames received from the smart card", as claim 46 recites. You's  
19 client server communications are completely silent on any type of "debug filter" or  
20 "debug frames received from a smart card." Thus, the combination of Barnett in  
21 view of You does not teach or suggest the features of claim 46.

22 Accordingly, and for this additional reason, the 35 USC §103 rejection of  
23 claim 46 should be withdrawn.  
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1 If claim 46 is again rejected on a similar basis in a subsequent action, it is  
2 respectfully requested for the Office to specifically point out where such a "debug  
3 filter" or "debug frames received from a smart card" are taught or suggested.

4 In another example, claim 47 recites "wherein the smart card development  
5 interface comprises a debug filter to identify debug frames within the received  
6 normal communication flow. For the reasons already discussed, the cited  
7 combination does not teach or suggest these features. Accordingly, for this  
8 additional reason, the 35 USC §103 rejection of claim 47 should be withdrawn.

9 In another example, claim 49 recites "a communication protocol, employed  
10 by the computer system and the smart card to communicate therebetween, the  
11 communication protocol comprising, a plurality of application frames comprising  
12 a normal communication flow between a host application and a smart card  
13 application", and "one or more debug frames, interlaced with the application  
14 frames within the normal communication flow, to enable a debug application  
15 executing on the host system to selectively access and control smart card  
16 resources."

17 In addressing these features of claim 49, and even though the ACTION has  
18 placed this rejection under a heading that implies that multiple references were  
19 combined to form the rejection, the explanation in the ACTION points only to a  
20 single reference, Barnett, Fig. 6, and elements 108 and 104 to conclude that claim  
21 49 is obvious in view of the reference. Thus, the ACTION is seemingly relying on  
22 personal knowledge to modify Barnett to arrive at the features of claim 49.

23 *"When a rejection in an application is based on facts within the*  
24 *personal knowledge of an employee of the office, the data shall be as*  
25

1 *specific as possible, and the reference must be supported, when*  
2 *called for by the applicant, by the affidavit of such employee, and*  
3 *such affidavit shall be subject to contradiction or explanation by the*  
4 *affidavits of the applicant and other persons."* 37 CFR  
5 §1.104(d)(2).

6 In view of this, and if this rejection is maintained on a similar basis in a  
7 subsequent action, Applicant respectfully requests the Examiner to supply such an  
8 affidavit to support this modification to Barnett.

9 In addressing claim 49, the ACTION points to Barnett, Fig. 6, and elements  
10 108 and 104 to conclude that claim 49 is obvious in view of the reference. This  
11 conclusion is unsupportable. Fig. 6, element 108 is a "host computer", and  
12 element 104 is "debug logic in [a] FPGA". For the reasons already discussed,  
13 Barnett's system that includes debug logic 104 and host computer 108 do not teach  
14 or suggest "a smart card incorporating a smart card development interface" of  
15 claim 41, upon which claim 49 depends. At most Barnett teaches that a smart card  
16 can be connected to the emulator debug logic 104 for debugging. This teaching  
17 also does not teach or suggest the claimed "debug frames" and their claimed  
18 context. Instead, it is respectfully submitted that Barnett essentially teaches what  
19 is described in the "Background of the Invention" section, wherein "the  
20 development of applications for a smart card currently requires the use of an in-  
21 circuit emulator (ICE) and an associated, often proprietary software development  
22 application."

23 Although the ACTION does not explain how Barnett could be modified  
24 with another reference (e.g., You ?) to supply these features of claim 49 that are  
25

missing, it is respectfully submitted that You does not teach or suggest the claimed features for the reasons already discussed above. Accordingly, and for these additional reasons, the 35 USC §103 rejection of claim 49 should be withdrawn.

#### Claim Objections

Claims 44 and 48 stand objected to as being dependent on a rejected base claim, but would be allowable if re-written in independent form including all limitations of the base claim and any intervening claims. In addressing claims 44 and 48, the ACTION supports the indication of allowability by admitting that "the prior art does not teach or render obvious "wherein the application development tool populates a source and/or destination field of the debug frame with an invalid source and/or destination address." Applicant thanks the Office for this indication of allowability. However, it is respectfully submitted that claims 44 and 48, as well as their respective base claims and any intervening claims, are patentably distinguished over the references of record for the reasons discussed above.

#### Conclusion

Claims 41-29 are in condition for allowance and action to that end is respectfully requested. Should any issue remain that prevents allowance of the application, the Office is encouraged to contact the undersigned prior or issuance of a subsequent Office action.



1 Respectfully Submitted.

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3 Dated: 3/05/04 —

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